Patricia L. McBride,
Chair, Wilson Fellows Committee,
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Fermilab, October 30, 2003

Object: Application for Wilson Fellowship Program

Dear Dr McBride,

I'm applying for the Wilson Fellowship Program.
I'm currently a Senior Research Associate at TUFTS University, working for the CDF experiment at Fermilab.

I started my scientific career as a phenomenologist, working on issues related to fragmentation phenomena in perturbative QCD. After my graduation at University of Pavia, Italy, in 1995, I joined the CDF experiment as visiting scientist at Lawrence Berkeley Laboratory, with a fellowship from Collegio Ghislieri, Pavia. I worked, in the framework of the top analysis, on aspects related to the systematic uncertainties present in the determination of the top mass.

In 1997 I joined the TUFTS University CDF group and since then I have been involved in the CDF experiment at Fermilab and, for a smaller fraction of time in the ATLAS experiment at CERN.

I have been involved in activities related to software development for large high-energy physics experiments, as data handling and analysis/visualization tools and simulation programs.
In 1997-98 I worked on the proposal for a data handling system based on the use of a OO database (Objectivity/DB) for CDF and measured OO database performances in the framework of the ATLAS offline group and MONARC collaboration.
In 1999 I was appointed leader of the trigger simulation project at CDF. The trigger simulation is a set of several C++ software simulation/emulation packages for L1/L2; they are used as an offline tool to calculate rates and efficiencies and as an online monitoring tool, during data taking as one of the monitors running in the control room. The project was successfully completed in time for the beginning of Run II data taking. In 2001 I started working on a simple ntuple representation of the CDF event that would have allowed users to be decoupled from the analysis framework for

all the type of analysis not requiring the use of reconstruction modules, while at the same time maintaining a one-to-one correspondence with the event content. The resulting product, called eN or evtNtuple is now one of the 3 major analysis tools in CDF and I am the librarian for it.

On the physics analysis side, after my initial work in QCD phenomenology (and a short digression to cosmology) , I concentrated my interests on searches for physics beyond the Standard Model. From 1998 to 2000 I served as the convener of a subgroup of the Exotic Physics group, aimed at defining triggers and datasets for exotic searches at Run II. In the meantime, I carried out a Run I analysis aimed at searching for the supersymmetric partner of the bottom quark, produced from the decay of gluinos, in collaboration with the Padova/INFN CDF group. From January 2001 to December 2002 I was convener of the Exotic Physics group itself, at a time where CDF was setting the stage for run II analysis. At the present time I'm working on physics analysis using run II data, aimed at the search for Leptoquarks. I presented my results at the 2003 Rencontres de Moriond on ElectroWeak Interactions and Unified Theories. Subsequent results have been shown at the EPS conference and Lepton-Photon Conference in 2003.I am interested now to move on to searches for Supersymmetry in channels involving leptons, jets and missing energy.

During the last few years I have been supervising several Italian summer students at Fermilab, who in general continued working toward obtaining a degree in particle physics. At the present time I'm supervising two Tufts students toward their thesis projects.

My scientific path has been quite diversified. I was given the opportunity to move relatively smoothly from my theoretical origins to more technical (software) aspects of an experimental reality like CDF. This has given me the possibility of keeping a unified view of high-energy physics since my expertise goes from the theoretical foundations of physics to technical aspects of a HEP experiment. In the last few years I have also demonstrated very good leadership skills as well as the ability to work in a team, while involved in the CDF preparation for Run II.
I am interested in continuing working for the CDF experiment, but in the next few years I would move toward a major involvement in the LHC experiments.
I have spent the last ten years at Fermilab and I have enjoyed very much the scientific atmosphere of the laboratory. I'd very much like to be involved in the current and future programs of the laboratory, since I am interested in pursuing a full time research career, as opposed to a part time career split between research and teaching duties. I feel I have a strong profile for a scientific position.

Sincerely,
Simona Rolli

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P.S.
My current resume is available at:
http://ncdf70.fnal.gov:8001/lifegc.html

The following referees will send letters of reference separately:

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